

WHAT IS CLAIMED IS:

1. A method for processing one or more oblique features on a mask or reticle substrate, the method comprising:

aligning the mask or reticle substrate with a predetermined reference system;

determining an offset angle of a feature to be processed on the mask or reticle substrate with regard to either a first reference direction or a second reference direction perpendicular to the first reference direction of the predetermined reference system;

rotating the mask or reticle substrate in a predetermined direction by the offset angle; and

processing the feature on the mask or reticle substrate according to the predetermined reference system wherein the feature is processed in either the horizontal or vertical reference direction thereof.

2. The method of claim 1 the aligning further includes positioning the mask or reticle substrate on a mask holder, the mask holder being on a mask stage of a mask processing tool.

3. The method of claim 2 wherein the predetermined reference system is defined by moving directions of the mask stage.

4. The method of claim 2 wherein the rotating further includes rotating the aligned mask holder by the offset angle.

5. The method of claim 2 wherein the rotating further includes using one or more stoppers on the mask stage for stopping the mask holder.

6. The method of claim 1 wherein the processing further includes forming or repairing the feature on the mask or reticle substrate.

7. The method of claim 1 wherein the processing further includes inspecting or verifying the feature on the mask or reticle substrate.

8. The method of claim 1 wherein the offset angle is about 45 degrees from either the first or second reference direction.

9. A mask processing system comprising:

means for receiving a mask or reticle substrate according to a predetermined reference system;

means for determining an offset angle of a feature to be processed on the mask or reticle substrate with regard to either a horizontal or vertical reference direction of the predetermined reference system;

means for rotating the mask or reticle substrate in a predetermined direction by the offset angle; and

means for processing the feature on the mask or reticle substrate according to the predetermined reference system wherein the feature is processed in either the horizontal or vertical reference direction thereof.

10. The processing system of claim 9 is a mask writing or repairing tool.
11. The processing system of claim 9 is a metrology tool, a verification tool, or an inspection tool.
12. The processing system of claim 9 wherein the means for rotating further includes a rotatable mask holder.
13. The processing system of claim 9 wherein the means for receiving further includes a mask stage whose moving directions define the predetermined reference system.

14. The processing system of claim 9 further comprising a mask or reticle substrate orientation monitoring subsystem for monitoring the position of the mask or reticle substrate.

15. The processing system of claim 9 wherein the offset angle is about 45 degrees with regard to either the horizontal or vertical reference direction.

16. A method for processing one or more oblique features on a mask or reticle substrate, the method comprising:

positioning the mask or reticle substrate on a rotatable mask holder on a mask stage;

aligning the mask or reticle substrate with a predetermined reference system defined by moving directions of the mask stage so that at least one side of the mask or reticle substrate is in a horizontal reference direction of the reference system;

determining a first offset angle of a first feature to be processed on the mask or reticle substrate with regard to either the horizontal or vertical reference direction of the predetermined reference system;

rotating the mask holder in a predetermined direction by the first offset angle; and

processing the first feature on the mask or reticle substrate according to

the predetermined reference system wherein the first feature is processed in either the horizontal or vertical reference direction thereof.

17. The method of claim 16 further comprising:

determining a second offset angle of a second feature to be processed on the mask or reticle substrate with regard to either the horizontal or vertical reference direction of the predetermined reference system;

rotating the mask holder to a desired orientation based on the first and second offset angles; and

processing the feature on the mask or reticle substrate according to the predetermined reference system wherein the second feature is processed in either the horizontal or vertical reference direction thereof.

18. The method of claim 16 further comprising monitoring the position of the mask or reticle substrate according to the predetermined reference system.

19. The method of claim 16 wherein the rotating further includes rotating the mask holder by using one or more mechanical stoppers on the mask stage.

20. The method of claim 16 wherein the rotating further includes rotating the mask holder by using an optical position monitoring subsystem.

21. A mask processing system comprising:

a mask stage for aligning a mask or reticle substrate wherein one side of the mask or reticle substrate is parallel to a horizontal reference direction of a predetermined reference system;

a processing module for determining an offset angle of a feature to be processed on the mask or reticle substrate with regard to either the horizontal or vertical reference direction;

a mask holder for rotating the mask or reticle substrate in a predetermined direction by the offset angle;

a mask or reticle substrate orientation monitoring subsystem for monitoring the position of the mask or reticle substrate; and

a mask processing module utilizing the predetermined reference system for processing the feature on the mask or reticle substrate wherein the feature is processed in either the horizontal or vertical reference direction.

22. The processing system of claim 21 wherein the mask processing module is a mask writing or repairing tool.

23. The processing system of claim 24 wherein the mask processing module is a metrology tool, a verification tool, or an inspection tool.

24. The processing system of claim 21 wherein the mask stage further includes one or more orientation monitoring subsystem for aligning the mask stage according to the horizontal or vertical reference direction.

25. The processing system of claim 21 wherein the offset angle is about 45 degrees with regard to either the horizontal or vertical reference direction.